

GE GLOBAL RESEARCH

CO₂ CAPTURE WITH LIQUID-TO-SOLID ABSORBENTS

PROJECT TITLE:	CO ₂ Capture Process Using Phase-Changing Absorbents		
ORGANIZATION:	General Electric (GE) Global Research	LOCATION:	Niskayuna, NY
PROGRAM:	IMPACCT	ARPA-E AWARD:	\$3,017,511
TECH TOPIC:	Carbon Capture	PROJECT TERM:	10/1/10 – 9/30/12
WEBSITE:	ge.gegloalresearch.com		

CRITICAL NEED

Coal-fired power plants provide nearly 50% of all electricity in the U.S. While coal is a cheap and abundant natural resource, its continued use contributes to rising carbon dioxide (CO₂) levels in the atmosphere. Capturing and storing this CO₂ would reduce atmospheric greenhouse gas levels while allowing power plants to continue using inexpensive coal. Carbon capture and storage represents a significant cost to power plants that must retrofit their existing facilities to accommodate new technologies. Reducing these costs is the primary objective of ARPA-E's carbon capture program.

PROJECT INNOVATION + ADVANTAGES

GE and the University of Pittsburgh are developing a unique CO₂ capture process in which a liquid absorbent, upon contact with CO₂, changes into a solid phase. Once in solid form, the material can be separated and the CO₂ can be released for storage by heating. Upon heating, the absorbent returns to its liquid form, where it can be reused to capture more CO₂. The approach is more efficient than other solvent-based processes because it avoids the heating of extraneous solvents such as water. This ultimately leads to a lower cost of CO₂ capture and will lower the additional cost to produce electricity for coal-fired power plants that retrofit their facilities to include this technology.

IMPACT

If successful, GE's absorbents would enable the reduction of significant greenhouse gas emissions while helping to position the U.S. as a global industry leader in carbon capture and storage technology.

- **SECURITY:** Enabling continued use of domestic coal for electricity generation will preserve the stability of the electric grid.
- **ENVIRONMENT:** Carbon capture technology could prevent more than 800 million tons of CO₂ from being emitted into the atmosphere each year.
- **ECONOMY:** Improving the cost-effectiveness of carbon capture methods will minimize added costs to homeowners and businesses using electricity generated by coal-fired power plants for the foreseeable future.
- **JOBS:** Retrofitting coal-fired power plants to capture and store carbon dioxide could create jobs in the U.S. manufacturing, construction, and engineering sectors.

CONTACTS

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